F1-264

APPLICANT QUALIFICATIONS
BIOGRAPHICAL INFORMATION STAFF AND CONSULTANTS

BAYKEEPER AND DELTAKEEPER: BayKeeper and DeltaKeeper are the only on-the-water citizen monitoring organizations dedicated to reducing pollution in San Francisco Bay and throughout the vast Delta tributary region upstream from Bay waters. In just eight years, BayKeeper has mounted a highly-effective, nationally-recognized pollution reduction campaign on San Francisco Bay, and has now expanded this work into the Delta. (DeltaKeeper is engaged in, among other projects, an extensive Delta Monitoring Project supported by East Bay MUDD). DeltaKeeper patrols the Delta with its three boats, identifying pollution sources. BayKeeper and DeltaKeeper detect and seek to reduce or eliminate pollution, dredging and other activities currently causing major damage to Bay/Delta water quality and habitat. BayKeeper has been recognized for its efforts by the UN Environmental Progamme, the national Management Center, and the California Environmental Protection Agency. It has also been recognized as one of the top organizations implementing the Comprehensive Conservation and Management Plan developed by the National Estuary Program for San Francisco's Bay and Delta.

In just eight years, BayKeeper has: * Responded to more than 780 incidents - working with polluters to clean up, and pursuing cases against willful violators, * Directed more than $1.2 million in funds from successful pollution settlements to important Bay restoration projects, including fisheries enhancement, wetlands restoration, toxic discharge reduction and restoration projects employing disadvantaged youth in their own communities, * Initiated study to assess health risks of fish contamination from heavy metals and pesticides. Prompted the Regional Water Board and the Dept. of Health to undertake a full-scale study, * Developed clean water programs with dischargers and introduced them to equipment which would reduce their pollution impacts, * Begun to build an informed constituency for Bay and waterway protection through media articles and newscasts reaching millions of people across the U.S. and through dozens of presentations yearly to Bay and Delta area clubs, groups, and professional conferences, * been a founder of the 14-member National Alliance of River, Sound, and BayKeepers and the West Coast Keeper Alliance, which pursue national and coastal strategies to stop pollution.

Michael Lozeau, Esq., BayKeeper and Executive Director. J.D. Honors Rutgers University. For five years before he became Director, Mike was General Counsel and Program Director for BayKeeper. Prior to that, he was Associate Attorney at Sierra Club Legal Defense Fund and a sole practitioner, specializing in Clean Water Act and Endangered Species litigation. He has worked with a coalition of environmental groups on protection of the endangered Desert Tortoise, on opposition to a low-level nuclear waste dump in Ward Valley, CA., and as lead attorney in the Penn Mine pollution case. He has been instrumental in developing BayKeeper's highly successful Legal Program and in setting up new environmental law clinics with U.C. Berkeley and Golden Gate University.

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U.C. DAVIS AQUATIC TOXICOLOGY LABORATORY

Dr. David Hinton has over 28 years of experience in the fields of aquatic toxicology and carcinogenesis. He is a tenured faculty member of the Department of Anatomy, Physiology, and Cell Biology in the School of Veterinary Medicine at University of California at Davis. Dr. Hinton will oversee all studies and provide guidance with respect to experimental design and interpretation of data. He has served as Professor of Fish Pathology and Aquatic Toxicology in the Agricultural Experiment Station at U.C. Davis and in the Aquaculture and Fisheries Program at the University, As Associate Professor in the Dept. of Anatomy and Pathology at West Virginia University Medical Center, and Assistant Professor in the Department of Pathology at the University of Baltimore School of Medicine. Dr. Hinton holds a Ph.D. from from the University of Mississippi Medical Center.

TERRY STRANGE, INSTRUCTOR, DELTA COLLEGE: M.S. Natural Resources, Humboldt State University. Instructor at San Joaquin Delta College and University of the Pacific in Stockton. He has also taught at Sacramento City College, College of the Redwoods, and Humboldt State University. He is a fisheries biologist and wetlands specialist for the San Joaquin County Mosquito and Vector Control District.

PROJECT ADVISORS

DR. G. FRED LEE Dr. Lee is the President of G. Fred Lee and Associates and formerly Distinguished Professor, Civil and Environmental Engineering, New Jersey Institute of Technology. He has served as a Senior consulting Engineer for EBASCO-Envirosphere, N.J., as Coordinator for the Estuarine and Marine Water Quality Management Program for the New Jersey Marine Sciences Consortium Sea Grant Program and as Director of the Site Assessment and Remedial Action Division for Industry Cooperative Center for Research in Hazardous and Toxic Substances.

DR. DALE SANDERS, PH.D. Senior Planner, Physical and Environmental Planning Office, U.C. Berkeley (1987 - present). Dr. Sanders has been an instructor in Environmental Science and Conservation and Resource Studies at U.C. Berkeley, and formerly taught at California State University. He also served as Senior Planning Ecologist for the Contra Costa County Environmental Program, and has published extensively on human impacts on wildlife.

F1-264

PROJECT TITLE: PILOT STUDY - DELTA TOXICITY MONITORING PROJECT
EFFECTS ON ANADROMOUS AND ESTUARINE SPECIES"

NAME OF APPLICANT: SAN FRANCISCO BAYKEEPER, BLDG. A, FORT MASON CENTER, SAN FRANCISCO, CA 94123.
PHONE (415) 567-4401, FAX: (415) 567-9715, EMAIL: BAYKEEPER@IGC.ORG
TYPE OF ORGANIZATION AND TAX STATUS: *Nonprofit 501(c)3 organization*
TAX IDENTIFICATION NUMBER: 68-0120240
TECHNICAL AND FINANCIAL CONTACT PERSON(s):
Bill Jennings, DeltaKeeper (209) 464-5090
Marsha Mather-Thrift, BayKeeper Dev. Director (415) 567-4401, ext. 19
PARTICIPANTS/COLLABORATORS IN IMPLEMENTATION: U.C. Davis Toxicology Laboratory, Dr. David Hinton, DeltaKeeper volunteers, including professionals from the University of the Pacific and Delta College at Stockton, and in collaboration with the Regional Water Quality Control Board aquatic toxicology staff.
RFP PROJECT GROUP TYPE: Nonprofit Organization, Services

II. BRIEF PROJECT DESCRIPTION AND NEEDS ADDRESSED: DeltaKeeper, a project of BayKeeper, identifies pollution incidents and conducts ongoing water quality analysis designed to reduce pollution in the Delta. Since its inception, DeltaKeeper has worked with staff from the Central Valley Regional Water Quality Control Board and U.C. Davis, among others, to establish a Toxicity Monitoring Program designed to provide baseline data on the contaminants in Delta waterways that are likely to have impacts on fish and other aquatic species. The Toxicity Monitoring Program is now underway with an initial appropriation of $20,000 from an EPA 319h grant to Placer County Resource Conservation District. A $50,000 challenge grant has also been awarded contingent upon matching funds of $50,000 raised by 11/1/97. We request a $50,000 match from the CalFed Bay/Delta Program.

Riverine and Delta populations of phytoplankton, zooplankton and several fish species (striped bass, Delta smelt, splittail, salmon) are in decline. DeltaKeeper proposes to conduct baseline monitoring at 12-14 sites (selected with UCD and RWQCB staff) throughout the Delta and East Side tributaries in order to establish toxicity levels. DeltaKeeper is developing citizen monitoring QA/QC procedures and training materials through the Placer County grant. Volunteers will be trained utilizing these materials in classes to be conducted by Delta college and UOP staff in conjunction with DeltaKeeper. The University of California at Davis Aquatic Toxicology Laboratory will provide scientific services, conduct bioassays and Toxic Identification Evaluations utilizing DeltaKeeper samples (to determine precise toxicants associated with specific locations, and produce final scientific reports. The results will provide vital data on contaminants in the Delta. It will also provide specific information to enhance DeltaKeeper's monitoring program and public education efforts focussed on reducing toxic discharges to Delta waters.

PROPOSAL - DELTA TOXICITY MONITORING PROJECT
EFFECTS ON ESTUARINE AND ANADROMOUS SPECIES

BACKGROUND: In January 1996, BayKeeper launched a new project called DeltaKeeper, headquartered in Stockton, which monitors the Delta and its tributaries. DeltaKeeper identifies pollution incidents and conducts ongoing water quality analysis. Since its inception, DeltaKeeper has been working with university experts, the Central Valley Regional Water Quality Control Board aquatic toxicology staff, and the U.C. Davis Toxicology Laboratory, among others, to establish a Delta Toxicity Monitoring Project designed to provide significant baseline data on contaminants in Delta waterways. The Delta Toxicity Monitoring Project is underway with an initial appropriation of $20,000 from an EPA 319h grant to Placer County Resource Conservation District. DeltaKeeper is working with the County to develop materials and training for a demonstration volunteer monitoring program designed to use citizen volunteers and successfully employ QA/QC (quality assurance/quality control) monitoring procedures. Establishment of such a training program provides the groundwork for use of volunteers as an effective, low-cost force aiding in the collection of scientific data. DeltaKeeper has also been awarded a $50,000 challenge grant from the David Gold Foundation for an initial toxicity monitoring study, using DeltaKeeper's trained staff, volunteers and the newly-developed volunteer resources provided by the 319h grant. The Gold grant is contingent upon raising another $50,000 by November 1, 1997.

PROJECT DESCRIPTION AND GRANT REQUEST: BayKeeper requests a matching grant of $ 50,000 from the Cal-Fed Bay Delta Ecosystem Restoration Program to conduct a one-year study which will establish baseline toxicity data for the Delta and complement similar efforts, such as Sacramento River Watershed Project and the Monitoring Program conducted for the San Francisco Estuary by the San Francisco Estuary Institute. This project will provide data on specific toxicants impacting overall waterway and ecosystem health. This pilot project will also provide important information, useful in strategy development and implementation of DeltaKeeper's on--the-water boat patrol and toxic discharge eduction programs. DeltaKeeper's proposed study will provide baseline toxicity data at 12-14 sites, second-stage studies at sites throughout the Delta, and a reduced number of Toxic Identification Evaluations to document specific contaminants present. The U.C. Davis Toxicology Laboratory will provide scientific services and scientific reporting at very low cost. Although initial isolated studies have been conducted, no comprehensive monitoring program has been implemented despite compelling evidence that toxicity has reached serious levels.

This project is a pilot project designed to initiate DeltaKeeper's proposed full Toxicity Monitoring Project proposal in the event that full funding for that study is not available. No special studies on local species will be conducted. We hope that this small-scale effort will aid in raising additional funding for further studies, including

proposed studies on local species.

As a highly-skilled nonprofit citizen monitoring organization, DeltaKeeper can conduct such a study in a low-cost highly efficient manner. Grant funds would be used to support 1) project development, coordination and oversight by BayKeeper Michael Lozeau and DeltaKeeper Bill Jennings, 2) operation of the DeltaKeeper boats to gather samples, 3) analyses and reporting performed by the U.C. Davis Aquatic Toxicology Laboratory, 4) hiring of technical consultant(s), 5) project overhead, including copying printing, utilities and telephone, 6) volunteer coordination, 7) and database management to compile data on sampling and study activities.

In late 1996, DeltaKeeper conducted a major citizen monitoring effort during peak season storms. Sampling and followup analysis documented a prolonged sag in dissolved oxygen levels and serious concentrations of diazinon, chlorpyrifos and other toxic chemical substances in all streams sampled. These conditions resulted in a substantial fish kill. The pilot Delta Toxicity Project will involve a small-scale 12-14 site monitoring program at selected sites throughout the Delta and East Side Tributaries (sites selected with UCD and RWQCB staff).

BIOLOGICAL/TECHNICAL JUSTIFICATION AND PROJECT APPROACH

Riverine and Delta populations of phytoplankton, zooplankton and several fish species Striped Bass, Delta Smelt, Split Tail, and Salmon are in decline. In recent years, the number of striped bass and the ocean harvest of salmon has dropped precipitously. The presence of contaminants is one of the factors that have been suggested to account for this. For example, Striped Bass and their primary food source *neomysis* have been shown to exhibit toxicity to rice field effluent. And, a recent study showed that water in the San Joaquin River was toxic to aquatic life in 50% of the samples taken over the course of a year. The USGS has also documented pulses of toxicity from stormwater coursing through the Delta in both the Sacramento and San Joaquin River channels, and yet there has been no further work, such as studies on dispersal rates, residence times, or impacts on local species. Clearly, more work is needed with key species, to determine which toxicants may be responsible for declines in Delta fish and food species.

In the last three years, some toxicity assessment work has been done in the Delta thanks to short-term funding from the Bay Protection and Toxic Cleanup Program, which is now in its final months. New funds need to be obtained to continue monitoring the health of this critical habitat. The Sacramento River Toxic Pollutant Control Program will focus on contaminant effects in the Sacramento River Watershed only. Similarly, the San Francisco Estuary Institute conducts the Regional Monitoring Program for the Estuary itself, but no comparable program exists for the Delta, a critical missing link.

Toxicity is routinely detected in the Delta, in the Sacramento and San Joaquin Rivers, and in East Side tributaries, which provide the majority of freshwater flows to the Delta, and ultimately to San Francisco Bay. Toxicity has been detected using the EPA protocols, which rely on three indicator species: the fathead minnow, *Ceriodaphnia dubia* (zooplankton) and *Selenastrum capricornutum* (phytoplankton). Several studies have linked observed toxicity to pesticides, and established the presence of unidentified toxicity. Identification of the specific contaminants is essential if strategies are to be developed to reduce the level of toxicity. Finally, although the existence of toxicity to indicator species is commonly-known, no landscape assessment of toxicity or "map" of toxic discharge points in the Delta exists.

Once contaminant types and sources are identified, a comprehensive and coordinated campaign can be mounted to develop Best Management Practices, reduce or eliminate runoff, direct discharge, overspray practices, stormwater overflows and other sources which, when added together produce massive contamination that threatens the increasingly precarious health of Delta waterways.

The total Delta Toxicity Monitoring Project will be conducted jointly by highly-experienced major partners. Staff from the Central Valley Regional Water Quality Control Board have provided background data and technical advice in developing the project to this point, and will continue to advise as needed:

1) BayKeeper/DeltaKeeper will coordinate all aspects of the project, training skilled volunteers through college credit and other courses, mounting regular tributary monitoring patrols, setting up sampling stations, providing resources for water sample collection, and coordinating volunteers, staff and consultants who will conduct this work; 2) the University of California at Davis Aquatic Toxicology Laboratory and Dr. David Hinton will provide scientific services, conduct bioassays, develop analyses and complete reporting of scientific results for the project.

The project being proposed by BayKeeper is designed as a complementary project to others which have been undertaken with the goal of linking the Sacramento Watershed, the Delta, and the Bay. **The BayKeeper project is intended to ensure that significant information can be gathered, analyzed, and reported with final conclusions despite the uncertain life expectancy of other monitoring programs.** The project does not duplicate existing activities. Instead, it extends them and ensures completion. Other currently existing projects include:

* The Bay Protection and Toxics Cleanup Program for Region 5 - ending 1997
* State Board Trends Monitoring Program - (also ending after 1996-97)
* The Sacramento River Watershed Protection Program -(one-year support currently)

PROJECT WORKPLAN: The proposed program will consist of the following parts:

1) A regular monitoring program using the EPA 3 species protocols to monitor for toxicity at 12-14 sites throughout the Delta and East Side tributaries for 12 months. Sampling stations will be established at each of the sites. Samples will be regularly collected and analyzed for toxicity, aiding in the establishment of trend data related to various seasons of rainfall, agricultural pesticide spraying, and other activities. The Monitoring Program is being designed with assistance from DeltaKeeper's Advisory Committee, which includes highly-experienced scientists from universities and the private sector, such as private consultant and engineer Dr. G. Fred Lee and Dr. Gary Litton, Terry Strange, and Dr. Dale Sanders, who are part of the teaching staff at the University of the Pacific, Delta College, and U.C. Berkeley, respectively.

2) The conducting of Toxicity Identification Evaluations on samples exhibiting acute toxicity.

A consultant would assist DeltaKeeper in designing protocols and assessing additional studies or sample collection work which might be needed.

ANTICIPATED BENEFITS: The proposed project would provide vital information now missing in attempts to stop the decline of local fisheries. Evidence suggests that pesticides and unidentified contaminants are a significant source of toxic pollution in Delta tributaries and waterways, but no conclusive work has yet been done. This project would fill in the "information gap" which now exists. It is likely that a number of factors contribute to the decline of key species. Several years will be needed to determine the role of toxics relative to other factors. We believe this one-year project will provide important information not now available, encourage public interest in this crucial project, and focus attention on the critical plight of water quality in Central Valley Rivers. Information provided would also be utilized by the BayKeeper/DeltaKeeper Toxic Reduction Program to develop strategies for more effective direct action to reduce contamination from pollutants.

PROJECT MANAGEMENT AND IMPLEMENTATION: The major partners in this project have extensive complementary skills and a significant history in successful management of projects of this kind. For ten years, the U.C. Davis Aquatic Toxicology laboratory has collaborated with the Central Valley Regional Water Quality Control Board staff to identify toxic pesticides associated with the use of dormant spray insecticides. They have conducted studies on insecticide problems in the Colusa Basin Drain caused by rice crops and affecting Neomysis and striped bass. U.C. Davis laboratory staff have also worked with CVRWQCB staff to develop Toxic Identification Evaluation (TIE) techniques for agricultural and urban stormwater runoff. In addition, the laboratory has extensive experience in testing with the EPA's 3 species (fathead minnow, *Ceriodaphnia,* and *Sellenastrum*). They also have developed the ability to conduct toxicity testing for zooplankton such as *Neomysis* and for Rotifers. Dr. David Hinton is well-known for his expertise on effects of contamination on various species. The U.C. Davis Aquatic Toxicology Laboratory

staff are uniquely qualified to conduct toxicity assessments and determine contaminant effects. All studies, protocols, and materials needed to implement this study are being transferred from the Central Valley Regional Water Quality Control Board to BayKeeper and DeltaKeeper.

IMPLEMENTATION ISSUES: The BayKeeper Toxicity Monitoring Project began in part in 1996 with monitoring of toxicity from stormwater outfalls during peak rain events. Grants of $20,000 have now been awarded and for this work and an additional $50,000 challenge grant will be awarded if matching funding is confirmed available by November 1, 1997.

EVALUATION: BayKeeper and DeltaKeeper will evaluate the project on a quarterly basis and conduct a full evaluation at the end of each one-year portion of the study. Criteria for evaluation of project success will include:

* Number of sites and number of samples taken at each over a specified period
* Number of TIE's conducted
* Measurable results indicated in the studies themselves
* Number of individuals receiving public information material
* Other studies prompted by this project
* Number of contaminant types and sources identified
* Develop Best Management Practices to reduce or eliminate specific, high priority, toxic discharges.

SUMMARY: We hope that the Cal Fed Bay/Delta Program will choose to provide a grant to support this important work.

VII. TOTAL PROJECT - PILOT BASELINE STUDY

AGENCY/TASK	one year
BAYKEEPER	
Proj.Coord. PT	14,000
BayKeeper 15% FT	2,250
DeltaKeep 50% FT	7,260
Boat op costs	4,700
DBase Admin 50% FT	4,000
Benefits & Taxes @ 14 %	3,851
Overhead @ 15 %	5,410
SubTotal BayKeeper/ DeltaKeeper	**41,471**
U.C. DAVIS TOXICOLOGY LAB	
Monthly 3 spp tests	40,000
TIE's (Toxic Identification Evalutions) (reduced in frequency)	20,000
Report preparation	
Analytical chemistry	15,000
UCD overhead 10%	9,000
Subtotal U.C. Davis	**$99,000**
CONSULTANT (S)	
Baseline study only	10,000
BASIC PROJECT BUDGET	**$155,471**
MATCHING FUNDS ALREADY AWARDED (INCOME)	70,000

Budget Narrative:

1. BayKeeper and DeltaKeeper work together to coordinate program strategy between the two groups and U.C. Davis, and develop projects. BayKeeper provides the pubic outreach and education component to publicize the results of studies and create grassroots awareness of environmental problems and solutions.

2. U.C. Davis will provide one-of-a-kind services as the premier scientific laboratory uniquely qualified to conduct this work. As a nonprofit, BayKeeper and DeltaKeeper are eligible for the 10% overhead rate rather than the much higher, public rate, a savings of thousands of dollars.

3. Technical advisors to date have included volunteered staff time U.C. Davis Laboratory, the Regional Water Quality Control Board, University of the Pacific and Delta College. BayKeeper also maintains an active involvement with university scientists in the Bay Area, some of whom sit on its Advisory Council. Outside technical expertise will be hired to fill this role if the study is funded.

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